

CLAIMS

We Claim:

- 5 1. A self-condensing sensor assembly for monitoring
 pH:

 An outer tubular member;

10 an inner tubular member, said outer tubular member co-
 linearly enclosing an inner tubular member;

15 an antimony sensor enclosed within said inner tubular
 member;

 a reference element enclosed within said outer tubular
20 member and located in a proximal position;

 a wick material, said wick material having one side
 which partially surrounds and substantially engages a
 portion of said inner tubular member, said wick
25 material extending from said antimony sensor to a
 proximal position whereby said wick material is
 substantially engaged to said reference element; and

30 an ion conduction media entrained or retained within
 said wick material.

2. The sensor as recited in claim 1, wherein said
35 wick material is selected from the group consisting of

fibrous polymeric meshes of polyester, polyimide,
polyethylene, polypropylene, polyvinyl chloride,
polystyrene, ABS, nylon, delrin, or polyethylene
terephthalate (PET), polytetrafluoroethylene (PTFE),
5 polysaccharide, or any combinations thereof.

3. The sensor as recited in claim 1, wherein said
10 wick is a porous material selected from the group
consisting of porous ceramic, metallic or polymeric
materials
4. The sensor as recited in claim 1, wherein said
15 ion conduction media contains a polysaccharide based
material.
5. The sensor as recited in claim 1, wherein said
20 ion conduction media comprises an electrolyte/water
based gel.
6. The sensor as recited in claim 1, wherein said
25 ion conduction media comprises a conductive polymer
7. The sensor as recited in claim 1, wherein said
reference element comprises silver chloride.
- 30 8. The sensor as recited in claim 1, wherein said
reference element comprises a silver element having a
silver chloride coating.

9. The sensor as recited in claim 1, wherein said co-linear configuration between said outer tubular member and said inner tubular member are offset.

5 10. The sensor as recited in claim 1, further comprising an electrical and display means which is in communication with the sensor and processes information obtained from said sensor for presenting a
10 pH reading.

11. A self-condensing sensor assembly for monitoring pH:

15 an outer tubular member;

an inner tubular member, said outer tubular member
20 coaxially enclosing an inner tubular member;

an antimony sensor enclosed within said inner tubular member and substantially engaged to said inner surface of said inner tubular member, said antimony sensor
25 including an electrical communication which extends to a proximal terminal position;

a reference element enclosed within said outer tubular member and located proximal to said antimony sensor,
30 said reference sensor element including an electrical communication which extends to the proximal terminal position;

a wick material, said wick material having one side which partially surrounds and substantially engages a portion of said inner tubular member, said wick material extending from said antimony sensor to a proximal position whereby said wick material is substantially engaged to said reference element; and

an ion conduction media is entrained or retained within said wick material.

12. The sensor as recited in claim 11, wherein said wick material is selected from the group consisting of fibrous polymeric meshes of polyester, polyimide, polyethylene, polypropylene, polyvinyl chloride, polystyrene, ABS, nylon, delrin, polyethylene terephthalate, (PET) polytetrafluoroethylene (PTFE), polysaccharide or any combinations thereof.

13. The sensor as recited in claim 11, wherein said ion conduction media contains a polysaccharide based material.

14. The sensor as recited in claim 11, wherein said ion conduction media comprises an electrolyte/water based gel.

15. The sensor as recited in claim 11, wherein said reference element comprises silver chloride.

16. The sensor as recited in claim 11, wherein said reference element comprises a silver element having a silver chloride coating.
- 5 17. The sensor as recited in claim 11, wherein said co-linear configuration between said outer tubular member and said inner tubular member are offset.
- 10 18. The sensor as recited in claim 11, further comprising an electrical connector on the proximal end of said sensor, said electrical connector is connected to said electrical communication with the antimony sensor and the reference element.
- 15 19. The sensor as recited in claim 11, further comprising a display means which is in electrical communication with the Antimony electrical communication and the reference element electrical communication; said display may further processes information obtained from said sensor for presenting pH data in digital or in an analog format.
- 20 25 20. The system as recited in claim 11, wherein said electrical communication is accomplished by a plurality of wires.
- 30 21. The system as recited in claim 11, wherein said electrical communication is accomplished by a wireless means.
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22. A self-condensing sensor assembly for monitoring
pH:

5 An outer tubular member;

an inner tubular member, said outer tubular member
coaxially enclosing an inner tubular member;

10 an antimony sensor enclosed within said inner tubular
member;

15 a reference element enclosed within said outer tubular
member and located in a proximal position;

20 a wick material, said wick material having one side
which partially surrounds and substantially engages a
portion of said inner tubular member, said wick
material extending from said antimony sensor to a
proximal position whereby said wick material is
substantially engaged to said reference element; and

25 an ion conduction media entrained or retained within
said wick material.

30 23. A self-condensing sensor assembly for monitoring
pH:

35 An outer tubular member;

an inner tubular member, said outer tubular member co-linearly or coaxially enclosing an inner tubular member;

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an antimony sensor enclosed within said inner tubular member;

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a reference element enclosed within said outer tubular member and located in a proximal position;

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a wick material, said wick material having one side which partially surrounds and substantially engages a portion of said inner tubular member, said wick material extending from said antimony sensor to a proximal position whereby said wick material is substantially engaged to said reference element;

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an ion conduction media entrained or retained within said wick material,

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said wick material and said antimony sensor are positioned at a terminal end of said outer tubular member, and

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said sensor assembly being of a small mass such that it functions to cool efficiently and subsequently condenses humid gases in close proximity to said sensor to form a liquid on said terminal end.

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24. A self-condensing sensor assembly for monitoring
pH:

an outer tubular member;

an inner tubular member, said outer tubular member
coaxially enclosing an inner tubular member;

an antimony sensor enclosed within said outer tubular
member and substantially engaged to said outer surface
of said inner tubular member, said antimony sensor
including an electrical communication which extends to
a proximal terminal position;

a reference element enclosed within said inner tubular
member and located proximal to said antimony sensor,
said reference sensor element including an electrical
communication which extends to the proximal terminal
position;

a wick material, said wick material substantially
enclosed within said inner tubular member, said wick
material extending from said antimony sensor to a
proximal position whereby said wick material is
substantially engaged to said reference element; and

an ion conduction media is entrained or retained
within said wick material.